

Seymour—U.S. Patent Application. No.: 10/009,347

I. AMENDMENT TO THE CLAIMS

1-31. (Canceled)

32. (New) A method for modifying the biological and/or physicochemical properties of a biological element, said method comprising reacting said biological element with a synthetic hydrophilic multivalent polymer having multiple reactive groups wherein the biological element is linked to the polymer by a plurality of linkages.

33. (New) A method as claimed in claim 32 wherein the biological element is an infectious agent that normally targets and interacts with particular sites or receptors in a host, wherein the polymer modification has the effect of modifying the infectivity of the biological element and/or retargeting it to a new or different site or receptor in the host.

34. (New) A method as claimed in claim 33 wherein the infectious agent is a viral vector containing therapeutic genetic material.

35. (New) A method as claimed in claim 33 wherein retargeting is achieved by incorporating a specific targeting group or moiety in the multivalent polymer and by ensuring that after modification the biological element is sufficiently coated with the polymer as to inhibit targeting and interaction with the original target site or receptor of the host.

36. (New) A method as claimed in claim 32 which has the effect of modifying the solubility or partition co-efficient characteristics of the biological element in non-aqueous media by virtue of a hydrophobic group incorporated in the polymer.

Seymour—U.S. Patent Application. No.: 10/009,347

37. (New) A polymer modified biological element in which the biological element is covalently linked to a synthetic hydrophilic multivalent polymer having multiple reactive groups wherein said polymer is linked to the biological element by at least two covalent linkages.

38. (New) A polymer modified biological element according to claim 37 wherein the biological element includes therapeutic genetic material.

39. (New) A polymer modified biological element according to claim 37 wherein the number of linkages between the polymer and the biological element is greater than three.

40. (New) A polymer modified biological element according to claim 37 wherein the linkage of said polymer to the biological element and modification of the latter results in the inhibition of the ability of the biological element to interact in a host biological system with other molecules with which it would otherwise normally interact or in the inhibition of the ability of the biological element to bind to sites or receptors to which it would otherwise normally bind.

41. (New) A polymer modified biological element according to claim 37 wherein said polymer is a biologically inert multivalent polymer having a backbone which is substituted by one or more said reactive groups.

42. (New) A polymer modified biological element according to claim 41 wherein each of the reactive groups is connected to the polymer backbone either directly or via a spacer group.

Seymour--U.S. Patent Application. No.: 10/009,347

43. (New) A polymer modified element according to claim 41 wherein the polymer backbone is based upon monomer units such as N-2-hydroxypropylmethacrylamide (HPMA), N-(2-Hydroxy ethyl)-L-Glutamine (HEG), ethyleneglycol-oligopeptide or dextran.

44. (New) A polymer modified biological element according to claim 37 wherein the polymer and/or the linkages between it and the biological element are hydrolytically or enzymatically degradable.

45. (New) A polymer modified biological element according to claim 37 wherein the polymer used to modify the biological element is cross-linked such that it forms a hydrogel.

46. (New) A polymer modified biological element according to claim 37 wherein a biologically active agent is coupled to or included in the polymer.

47. (New) A polymer modified biological element according to claim 37 wherein the biologically active agent is one or more of the following a growth factor or cytokine, a sugar, a hormone, a lipid, a phospholipids, a fat, an apolipoprotein, a cell adhesion promoter, an enzyme, a toxin, a peptide, a glycoprotein, a serum protein, a vitamin, a mineral, and an antibody recognizing receptor.

48. (New) A polymer modified biological element according to claim 37 wherein the biologically active agent is an antibody or antibody fragment.

Seymour—U.S. Patent Application. No.: 10/009,347

49. (New) A polymer modified biological element according to claim 48 wherein said antibody and antibody fragments are monoclonal.

50. (New) A polymer modified biological element as claimed in claim 37 wherein the biological element is a virus or other infective micro-organism and wherein the polymer is effective to bring about substantially a complete loss of the infectivity of the unmodified biological element.

51. (New) A polymer modified biological element as claimed in claim 37 wherein the modification of the biological element has the effect of retargeting the biological element to different receptors in a biological host.

52. (New) A polymer modified biological element as claimed in claim 37 wherein the modification of the biological element has the effect of modifying the solubility and dispersal and stability characteristics of the biological element within a non-aqueous environment.

53. (New) A polymer modified biological element as claimed in claim 37 wherein the biological element is a micro-organism having oil degradative activity.

54. (New) A polymer modified biological element as claimed in claim 37 wherein the polymer incorporates an oleyl or other hydrophobic group.

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Seymour—U.S. Patent Application. No.: 10/009,347

55. (New) A polymer modified biological element as claimed in claim 37 wherein the biological element is a baculovirus particle.

56. (New) A process for the preparation of a polymer modified biological element as defined by claim 37 which process comprises combining a biological element with a polymer.

57. (New) A polymer modified biological element obtainable by the process according to claim 56.

58. (New) A polymer modified biological element as defined by claim 37 for *in vivo* delivery of therapeutic genetic material to a patient, wherein the polymer modified biological element comprises a biological element which includes the therapeutic genetic material.

59. (New) A method of gene therapy which method comprises administering to a patient in need of such therapy a polymer modified biological element as defined in claim 37 which includes therapeutic genetic material.

60. (New) Use of a polymer modified biological element as defined in claim 37 for manufacture of a medicament for use in gene therapy wherein the polymer modified biological element comprises a biological element which includes therapeutic genetic material.

Seymour—U.S. Patent Application. No.: 10/009,347

61. (New) A composition comprising a polymer modified biological element as defined in claim 37 in association with a carrier.

62. (New) A composition as claimed in claim 61 wherein the carrier is a pharmaceutically acceptable additive, diluent or excipient.

63. (New) Use of a polymer modified biological element as claimed in claim 53 for treatment of oil pollutants.

64. (New) Use of a polymer modified biological element as claimed in claim 37 for delivery of biological pesticides to pathogens in the agricultural industry.

65. (New) A method according to claim 32 wherein the synthetic hydrophilic multivalent polymer comprises a polymer backbone based upon monomer units selected from the group consisting of N-2-hydroxypropylmethacrylamide (HPMA), N-(2-Hydroxy ethyl)-L-Glutamine (HEG), ethyleneglycol-oligopeptide or dextran.

66. (New) A polymer modified biological element as claimed in claim 37 wherein the biological element is an adenovirus.

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